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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/649,829	08/28/2003	Wataru Taki	2936-0194P	6644

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EXAMINER	
NGUYEN, MINH T	
ART UNIT	**PAPER NUMBER**
2816	

DATE MAILED: 06/15/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/649,829	TAKI ET AL.	
	Examiner	Art Unit	
	Minh Nguyen	2816	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *02 May 2005*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *4-7 and 11-18* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *4-7 and 11-18* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *28 August 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

1. Applicant's amendment filed on 5/2/05 has been received and entered in the case. Claims 4-7 and 11-18 are pending. The amendments and arguments do not overcome the prior art rejections noted in the previous Office action, and therefore, are remained for the reasons set forth below. This action is FINAL.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 4-6, 11-13, 15 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over US Patent No. 5,517,685, issued to Aoyama et al. in view of Humphries et al (Industrial electronics, Breton Publishers, 1983, chapter 2, page 38).

As per claim 4, Aoyama discloses a frequency conversion apparatus (Fig. 3), comprising:

a filter (HPF 21) having a fixed cut-off frequency for restricting a band of a reception signal (filter HPF 21 is fixed, the recited function is merely the function of a filter, HPF 21 receives the reception signal at input node INPUT SIGNAL) so as to selectively pass only a first frequency band component;

an isolation amplifier (22, the amplifier isolates element 21 and 23) for amplifying the reception signal having passed through the filter;

a variable filter (variable BPF 23) having a variable cut-off frequency for further restricting the band of the reception signal having been amplified by the amplifier (as shown, the BPF 23 receives the signal from the amplifier 22), so as to cut off at least part of the first frequency band component and thereby to selectively pass only a second frequency band component (this is merely the function of a filter); and

a mixer (MIXER 25) for mixing the reception signal having passed through the variable filter with a local oscillation signal (the signal is generated by the VCO 27),

wherein the amplifier cuts off reflected waves that fall outside a pass band of the variable filter (this limitation is met because there is no input port from the variable BPF 23 to the amplifier 22) and

wherein the cut-off frequency of the variable filter being controlled to vary according to a reception channel signal (the channel selection command).

Further, Aoyama explicitly discloses the variable filter is a band pass filter (BPF).

Aoyama does not explicitly disclose the variable filter is built by serially connecting together a variable low-pass filter for selectively passing only a low band component of a signal inputted thereto and a variable high-pass filter for selectively passing only a high band component of a signal inputted thereto as called for in the claim.

Humphries explicitly discloses a band pass filter is merely a combination of a lowpass filter and a highpass filter cascaded (page 38, column 1). In other words, a variable bandpass

filter is art recognized equivalent with a variable lowpass filter and a variable highpass filter serially connected.

It would have been obvious to one skilled in the art at the time of the invention was made to implement the Aoyama's variable bandpass by serially connecting together a variable low-pass filter and a variable high-pass filter.

The motivation and/or suggestion would be to allow the user more control of the frequency band of the spectrum by independently controlling the variable lowpass filter and the variable highpass filter.

As per claim 5, Aoyama discloses a frequency conversion apparatus which comprises elements and structure discussed in claim 4 herein above wherein the variable filter is a bandpass filter (BPF). Also discussed in claim 4, the bandpass filter is built using a variable low-pass filter and a variable high-pass filter serially connected. Further, Aoyama teaches the frequency conversion apparatus is used as a tuner in cable television CATV (column 1, line 18).

Aoyama does not explicitly disclose the variable filter is a highpass filter as called for in the claim.

However, as known by a person having an average skill in the art, when more channels are available, the frequency band of the variable bandpass filter must be made wider to accommodate more channels. When the frequency band is required to be much wider, the existing of a lowpass filter has little meaning. In this situation, eliminating the variable lowpass filter would result in cost saving without severely effecting the performance of the tuner.

It would have been obvious to one skilled in the art at the time of the invention was made to eliminate the variable lowpass filter in the frequency conversion apparatus discussed in claim 4. The motivation and/or suggestion would be to reduce the cost of the implementation.

As per claim 6, consider the Channel Selection Command is part of the PLL, the recited limitation is met because the variable filter receives the Channel Selection Command. As shown in Fig. 3, the frequency of oscillation of the VCO 27 is clearly controlled by the PLL.

As per claims 11-12, these claims are merely methods to operate the circuits having the structures discussed in claims 4-5, respectively. Since the structures discussed in claims 4-5 are disclosed, the methods to operate are seen as obvious.

As per claim 13, this claim is rejected for the same reasons noted in claim 6.

As per claim 15, this claim is rejected for the same reasons noted in claim 6.

As per claim 17, this claim is rejected for the same reasons noted in claim 6.

3. Claims 4-7 and 11-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over US Patent No. 6,112,070, issued to Katsuyama et al. in view of Humphries et al (Industrial electronics, Breton Publishers, 1983, chapter 2, page 38).

As per claim 4, Katsuyama discloses a frequency conversion apparatus (Fig. 1), comprising:

a filter (BPF 2A) having a fixed cut-off frequency for restricting a band of a reception signal (filter BPF 2A is fixed, the recited function is merely the function of a filter, BPF 2A receives the reception signal from the antenna ANT 1) so as to selectively pass only a first frequency band component;

an isolation amplifier (LNA 3, the amplifier isolates element 2A and 4) for amplifying the reception signal having passed through the filter;

a variable filter (variable BPF 4) having a variable cut-off frequency for further restricting the band of the reception signal having been amplified by the amplifier (as shown, the BPF 4 receives the signal from the amplifier LNA 3), so as to cut off at least part of the first frequency band component and thereby to selectively pass only a second frequency band component (this is merely the function of a filter); and

a mixer (MIX 5) for mixing the reception signal having passed through the variable filter with a local oscillation signal (the signal is generated by the VCO 8),

wherein the amplifier cuts off reflected waves that fall outside a pass band of the variable filter (this limitation is met because there is no input port from the variable BPF 4 to the amplifier LNA 3) and

wherein the cut-off frequency of the variable filter being controlled to vary according to a reception channel signal (the selected channel).

Further, Katsuyama explicitly discloses the variable filter is a bandpass filter (BPF 4).

Katsuyama does not explicitly disclose the variable filter is built by serially connecting together a variable low-pass filter for selectively passing only a low band component of a signal inputted thereto and a variable high-pass filter for selectively passing only a high band component of a signal inputted thereto as called for in the claim.

Humphries explicitly discloses a bandpass filter is merely a combination of a lowpass filter and a highpass filter cascaded (page 38, column 1). In other words, a variable bandpass

filter is art recognized equivalent with a variable lowpass filter and a variable highpass filter serially connected.

It would have been obvious to one skilled in the art at the time of the invention was made to implement the Katsuyama's variable bandpass by serially connecting together a variable low-pass filter and a variable high-pass filter.

The motivation and/or suggestion would be to allow the user more control of the frequency band of the spectrum by independently controlling the variable lowpass filter and the variable highpass filter.

As per claim 5, Katsuyama discloses a frequency conversion apparatus which comprises elements and structure discussed in claim 4 herein above wherein the variable filter is a bandpass filter (BPF 4). Also discussed in claim 4, the bandpass filter is built using a variable low-pass filter and a variable high-pass filter serially connected. Further, Katsuyama teaches the frequency conversion apparatus is used as a tuner in mobile communication (the title).

Katsuyama does not explicitly disclose the variable filter is a highpass filter as called for in the claim.

However, as known by a person having an average skill in the art, when more channels are available, the frequency band of the variable bandpass filter must be made wider to accommodate more channels. When the frequency band is required to be much wider, the existing of a lowpass filter has little meaning. In this situation, eliminating the variable lowpass filter would result in cost saving without severely effecting the performance of the tuner.

It would have been obvious to one skilled in the art at the time of the invention was made to eliminate the variable lowpass filter in the frequency conversion apparatus discussed in claim 4. The motivation and/or suggestion would be to reduce the cost of the implementation.

As per claim 6, the recited limitations are shown in Fig. 1, i.e., the PLL circuit 9 controls the variable filter 4 through line 11 connecting the PLL 9 to the variable filter 4 (column 5, lines 36-38), and controls the VCO 8 through the line connecting the PLL 9 to the oscillator 8.

As per claim 7, because the PLL circuit 9 is controlled by the CPU, the recited limitation is met, i.e., CPU is digital device, a plurality of predetermined voltages must be provided for the CPU to select.

As per claims 11-12, these claims are merely methods to operate the circuits having the structures discussed in claims 4-5, respectively. Since the structures discussed in claims 4-5 are disclosed, the methods to operate are seen as obvious.

As per claims 13-14, these claims are rejected for the same reasons noted in claims 6-7, respectively.

As per claims 15-16, these claims are rejected for the same reasons noted in claims 6-7, respectively.

As per claims 17-18, these claims are rejected for the same reasons noted in claims 6-7, respectively.

Response to Arguments

4. Applicant's arguments filed on 5/2/05 have been fully considered but they are not persuasive.

Regarding the argument that Aoyama merely discloses element 22 is a gain variable control unit, not an isolation amplifier as claimed.

Aoyama's element 22 adjusts the amplitude of the input signal, it is seen as an amplifier. In column 3, lines 24-25, Aoyama explicitly discloses element 22 is used to adjust the amplitude of the input signal to a predetermined level. In other words, the input signal is multiplied by a predetermined factor through the element 22.

Regarding the argument that Aoyama fails to disclose element 22 provides isolation between the following circuit from the preceding circuit.

A reference has been cited to show that an amplifier is used for providing amplification or isolation of the input signal. US Patent No. 5,245,557, column 3, lines 1-2.

Regarding the argument that Aoyama fails to disclose the PLL controls the variable filter.

As discussed in the preceding rejection, by considering the Channel Selection Command signal to be part of the PLL, the variable filter 23 is seen as being controlled by the PLL because the variable filter 23 also receives the Channel Selection Command signal.

Regarding the argument that Katsuyama fails to disclose element LNA 2 provides isolation between the following circuit from the preceding circuit.

A reference has been cited to show that an amplifier is used for providing amplification or isolation of the input signal. US Patent No. 5,245,557, column 3, lines 1-2.

Regarding the argument that Katsuyama fails to disclose the frequency of the variable filter is controlled by a voltage synthesizing method.

As discussed in the preceding rejection, CPU is a digital device, a plurality of predetermined voltages must be provided for the CPU to select. In other words, the variable filter is controlled by a voltage synthesizing method.

Regarding the argument that Katsuyama uses the same signal from the PLL to set both the VCO 8 and the cut-off frequency of the variable BPF 4.

The examiner notes that claim 7 does not require the VCO 8 and the cut-off frequency of the variable BPF 4 are separately controlled by different sets of predetermined voltages.

Conclusion

5. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Minh Nguyen whose telephone number is **571-272-1748**. The examiner can normally be reached on Monday, Tuesday, Thursday, Friday 7:00-5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Timothy Callahan can be reached on 571-272-1740. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

6/9/05

Minh Nguyen
Primary Examiner
Art Unit 2816